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Faunistic studies on snakes of West Golestan state

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Abstract

The aim of present research was to study the snake fauna of western parts of Golestan province; from Gorgan city up to the border of Mazandaran province; by analysing the morphological characters and using identification keys. The studies were undertaken during 2008-2009. A total of 36 specimens were collected. These included 11 species belonging to 10 genera and 4 families; *Natrix tessellata, Natrix natrix*, *Elaphe dione*, *Hemorrhois ravergieri, Dolichophis jugularis, Platyceps najadum, Telescopus fallax* and *Zamenis persica* from Colubridae family, *Typhlops Vermiculari* from Typhlopidae family, *Naja oxiana* from Elapidae, *Gloydius halys caucasicus* from Viperida. Scaterred map of each species was plotted.

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Keywords: Golestan state, Snake, Faunistic

1. Introduction

Snakes have a lot of economical and sanitary advantages such as producing antibodies, use of skins in industry, as a protein resource in some countries and play an important role in ecosystem and food chains by controlling the farm pests [1]. Snakes are basically mono shaped, long and narrow without functional limbs [2]. The smallest one is a member of leptotyphlopidae family whose adult one is 10 mm long [3], while a normal python is about 10 m long [2]. These are distributed all over the world except Poles, Ireland and New Zealand [4]. Iran has variety of species and is attracting the attention of biologists due to its rare faunal taxa as well as weather condition [5]. Some workers have studies the systematics of snakes and based their findings on cladistic, molecular and morphological analysis. Some books on the Iranian reptiles published by different workers are in this field [4, 5]. Latifi [4] has reported 26 species of snake from Golestan province but without giving the collected zones [4]. In this paper we clarified the snakes of each city and named them based on the latest classification of Iranian reptiles [6] and prepared the scattered maps.

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2. Study Area

Golestan is located in the north of Iran between Alborzes Mountains, Khorasan Mountains within the southern flat of Turkmenistan, and Caspian Sea. It lies between 53°.57′ to 56°.22′ eastern longitude and 36°.30′ to 38°.8′ northern latitude, and is a mild zone. The province has a border with the Republic of Turkmenistan in the north, Khorasan province lies in the east, in the west it is borderd by Caspian Sea and Mazandaran province and Semnan province froms the South border. The area is about 204377 km^2, which makes 13 percent of Iran. There are three major zones;

Mountain zone: lying between 500 to 3000 m and covered by grasses and forests.

Mountainside zone: includes small semi hills and cotton fields and some forests.

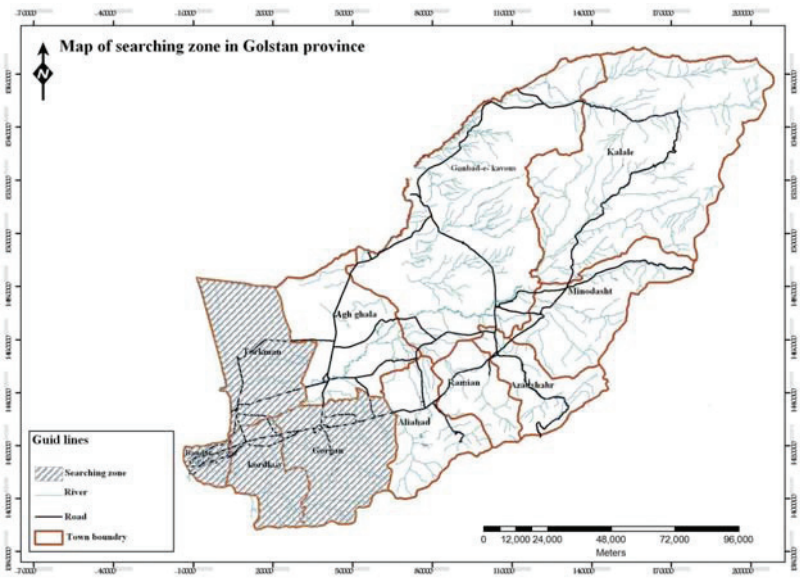
Flat and low-lying ground area: located alongside the Caspian Sea and Gorgan gulf ascending smoothly towards the east [7].

Gorgan is located in the south of province and bounded by Aq-Qalla and Turkmen city from the north, Semnan province from the south, Ali-Abad City from the east and Kord Kuy city from the west. The climate is of alpine type in the south and semi-humid in the north.

Kord Kuy is located on the west-south of Golestan, borderd by Turkmen city in the north, Semnan province in the south, Gorgan City in the east and Bandar-e-Gaz city and Mazandaran province in the west. It has mediterranean climate.

Bandar-e-Gaz city is in the west-south of province bordering Caspian Sea in the north, Mazandaran province in the south and west and Kord Kuy in the east. It has Mediterranean climate [8].

Bandar-e-Turkmen city is located on the west- north of Golestan, bordered by Turkmenistan in the north, Kord Kuy and Gorgan in the south, Aq-Qalla in the east and Caspian Sea and Gorgan Gulf in the west. It has semihumid climate in the southern area and semidry in the northern parts.



Map 1: Map of the area studied in Golestan province.

3. Methods

Investigations were started in the beginning of July 2008 and concluded at the end of August 2009.

The specimens were collected in different ways.

A) In forest and grass covering lands-it was more possible and rapid to find the non-venomous snakes. The bars or two-headed sticks were used because these were light and fast. In some cases we used our feet to and picked the snakes with three fingers: thumb, index and middle finger.

B) Alongside the banks of lagoons and in the boundary areas and flats we used a machine with a hook

and a long bar, and a separate part with a long bar attached to a zippered purse made from jeans. This was for collecting special snakes. Snake were also captured by the hook and transferred to the purse which was closed by a lever at the end of the bar.

C) To keep for taking a photograph we brought out the snake with a long pincer.

For an identification of the snake specimens these were placed in the bottles filled with ether and cotton. The bottles were then closed by a cap. For indetification initially more attention was paid to the size, color and the style of the body and the scales on the head. Help was taken from the books published on "Iranian snakes" and finally 10 meristics and 2 metric characteristics of body and tail were investigated (body length from snout to anus and tail length from anus to the end of tail), photographs were taken from different dimensions such as dorsal surface, ventral surface, back of the head, under the head and profile before fixing these species.

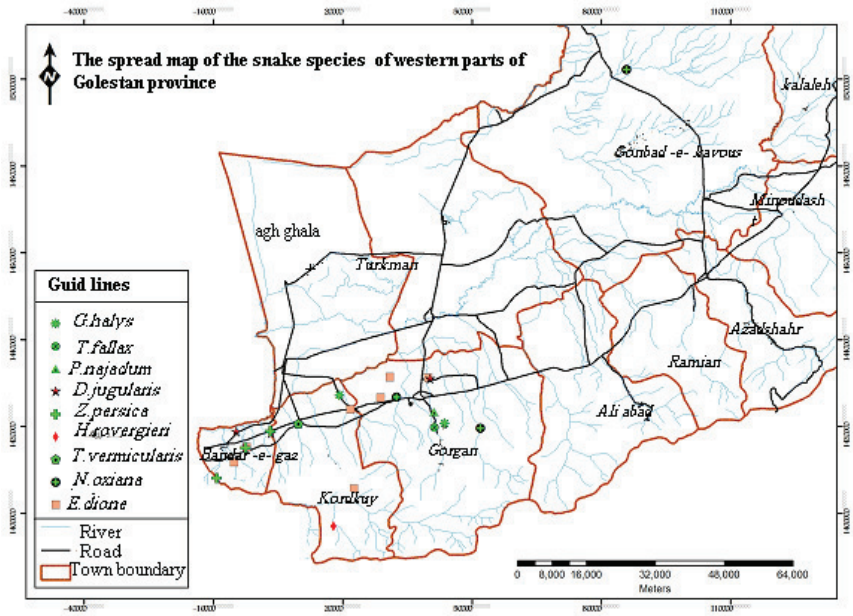
4. Results

In all 11 different types of snakes were collected. The species like *Zamenis persica* from Kord Kuy and Bandar-e-Gaz, *Dolichophis jugular* from Bandar-e-Gaz and *Typhlops vermicular* from Kord Kooy are reported for the first time from these areas. *Telescopus fallax* is reported from Gorgan and Golestan Province for the first time. The species are the members of 4 families and 4 subfamilies and 10 genera (Table 1, Map 2).

Table 1: Morphometric and meristic characters of the specimens.

Species Charecters	N.t	N.n	D.j	H.r	P.n	E.d	Z.p	T.f	G.h	N.o
Ventrals scals numbers	170-173	178-182	196-221	210	227	195-210	221-229	223	147-157	186-197
Subcaudals scals numbers	36-61	67-81	99-103	88	100	60-74	70-76	62	31-37	60-65
Dorsals scals numbers	19	19	19	21	19	27-29	23	19	23	21
Supralabials scals numbers	8	7-8	8	8	8	8-9	8	10	7-8	7
Infralabials scals numbers	10	9-11	9-10	10	9-10	10-12	9-10	11	9-11	8-9
AnteriorTemporals scals numbers	1	1	2	1,2	1,2	2,3	1,2,	3	2,3	2
PosteriorTemporals scals numbers	2	2	2-3	2-3	2-3	3,4,5	2,3	4	3	3,4
Preoculars scals numbers	2	1	1	2	2	1	1	1	2	1
Postoculars scals numbers	3	2,3	2	2	3	2	1,2	2	2	3
Sub Preoculars scals numbers	_	_	1	1	1	1	_	_	1	1
Length of body	25.5-79	54.5-100	103-152	77	88.5	46-120	35-96	57	25-54	143-157
Length of caudal	5.1-16.5	12.5-20	26-39	16	22	9-18	5.5-18.5	9	2.8-6.8	24-25
Speciment numbers	4	3	4	1	1	8	3	1	3	3

N.t = Natrix 3essellate, N.n = Natrix natrix, T.f = Telescopus fallax ,P.n = Platyceps najadum D.j = Dolichophis Jugularis, H.r = Hemorrhois ravergieri, Z.p = Zamenis persica, E.d= Elqphe dione ,T.v =Typhlops Vermicularis,N.o = Naja oxiana, G.h = Gloydius halys.



Map 2: The scattered map of the snake species from the western parts of Golestan province.

The general characteristics of these species are given below.

4.1. Typhlops vermicularis:

Necks are invisible, snouts are relatively down and rounder and in front part dorsal-ventral surface is compressed. Body is cylindrical, relatively of the same size, and caudal area is invisible, very short with a spine at the end. Eye is completely rounded, invisible and black. The scales of the heads are big and much more different than the snakes from other families. From upward their rostral is completely visible and in fact covered by a lot of parts of their heads. The features of anal area are like mouth. The color of snake is brownish red, like a earthworm and ventral surface is lighter. This snake is usually calm and motionless. Its habitat is in the Mediterranean zones under sand and soil. It was captured in the yard of a house at night.

4.2. Natrix tessellate:

Head and neck is visible, the snout is narrow and long. There are 19 mid body rows of scales which are keeled in 6 identified specimens. Olive- green to gray with some black spots in the length of body. Ventral surface is yellow with black blotches, yellow in front but black at the end of tail. In some cases the color is smooth and monochromic which is gray or soil-colored. Snake when captured was very calm and shy and often hides her head under the body. But whenever it feels a danger it will crawl and with a hissing sound move to frighten you. It lives near the lakes, rice farms and alongside water channels. The species is widely distributed in the area as such no map is given.

4.3. Natrix natrix:

Its head is completely visible, with a cylindrical body and the tail is relatively long. There are 19 mid body rows of keeled scales in 6 identified specimens. It is olive-green in colour with some black blotches all through the body length. A typical identification mark in these snakes is 2 yellow or white bands in the width of their head and also 2 bands in the length of their back upto their tails. Ventral surface under the

head, beneath of the neck is checkered, and towards the tail black color is more than white. The snake was observed to be much calm, motionless without bothering sound, resembling somewhat *Natrix tessellate.* It is distributed near the Caspian Sea, in the rice fields and near the lakes. A widespread species, except in the complet dry zones. No distribution map was thus drawn.

4.4. Dolichophis jugularis:

Head is visible, snout is relatively long, back of the head towards the sides is thicker and pupils of the eyes are round to oval. There were 19 mid body rows of smooth and pitted scales in the 4 identified specimens. Body color is dark yellow, light brown, sometimes with some dark blotches in every part of the body. In the scales the middle part is dark and sides are lighter. Ventral surface is completely pink or orange or red. It behaves angrily and farmer or anybody seeing this snake kills it. Generally it is olive-green in colour with two yellow dots on the temporal scales and two yellow or white bands on the sides of body. It is seen in the farms, low areas and dry-hot zones. It was observed in the fields around Gorgan, areas around Inche-Boroon and in the residential areas in Bandar-e-Gaz.

4.5. Hemorrhois ravergieri:

Head and neck are completely visible, the snout is raised upwards. There are 19 smooth dorsal scales in the body of the only specimen collected by us in the mountain area. Body color is light brown, but is wide dark brown on the back side upto the end of tail, ventral side is white with some tiny and hardly seen brown dots. Identification marks in this snake are 2 brown bands: one of them at the back of eye on the postoralar scale up to the end of mouth and the other one under the eye up to the 6^{th} and 7^{th} suprolabial scale. We found just one species in Kurd Kuy Mountains which was so calm without rushing behaviour.

4.6. Platyceps najadum:

Head is in the way of body, long and smooth, body is narrow and long and tail is very long. There are 19 dorsal pit smooth scales on the body of the only identified specimen. Light olive green and in the back of the neck there are some dark green dots with a white margin. These blotches are at 2 sides and resemble each other at first, but eventually they get small and the color is invisible. Ventral surface in all parts is white without any dots. Around the eyes, supralabial and infralabial areas are white and there is a short black band under the eyes which ends at 6^{th} and 5^{th} scales. We found just one snake of this species in the centre of Gorgan, which was calm without rushing mood and very curious and active.

4.7. Elaphe Dione:

Head is visible and narrow, snout is down and forward. We observed 8 species. In 7 ones there were 27 and in 1 there were 29 dorsal scales. The scales are completely smooth, a little or completely keeled and somehow pit. The color is green to gray or olive with some black dots which start from the back of neck in a bow-tie shape (∞) and it continues up to the end of the tail. There are 4 long dark bands which start from the back of the head, two of them continue up to the end of tail and 2 sided bands end in the anus. There is a black band which starts from the middle of nose and eye and continues up to the end of mouth. At the back of the head there is a sign like a crown or a butterfly. When it feels a danger it will defend by some blitzing and biting humans. It also makes vibrations of tail and kicks to the earth making a frightening sound. On the other hand it rounds the body and makes the body in a balling shape, in which it hides and keeps safe the body. We hunted this snake in the farms, villages even in the cities in hot-wet weather zones near the forest in Gorgan and Bandar-e-Gaz and around Kord Kuy.

4.8. Zamenis Persica:

It has narrow and long head, neck is visible and snout is down. We identified 3 specimens. There are 23 dorsal scales, some keeled and some smooth. It is smoothly black and there are some white dots in supralabial and infralabial surfaces. Underside of the belly is shiny gray and underside of the head and neck zone is white with some light gray dots. Adult animal is calm but young one is in a blitzing mood. It seems that snake inhabits in forests, farms and grasses. We collected these around Bandar-e-Gaz and Kord Kuy.

4.9. Telescopus fallax:

Head is visible and wide, neck is narrow, snout is short, and body is narrow, somewhat pressed on the sides and tail is relatively long. The pupil is vertical and has semi-oral shape. In the only identified specimen dorsal scales are 19 and smooth. This snake is brown and head is brown with many small dots. At the back of the neck there is a wide brown band followed by some small dots which continue upto the end of body. Ventral surface is gray or shiny brown and underside of the head is lighter with some brown dots. Dorsal scales are long and completely smooth and overlap each other. Habitats and distribution is not clear because we found just one specimen, but it seems that they live in flat and semi-hot grassland zones. This species was captured in the south of Gorgan in a residential area.

4.10. Gloydius Halys:

They have triangle- shaped head, visible neck, snout is up and somehow raised and visible tail and pupil is horizontal. It differs from viper just in having a pit between nose and eye. The 3 identified specimens had 23 dorsal, keeled scales. Body color from the back of neck to the end of body is brown with some light brown dots. Sides are light brown with darker dots with a distance between them and ventral surface is completely lighter with small brown dots. There is a chocolate brown band from the back of eyes to the end of mouth. In a dangerous condition this animal twists and hurl the front of body to bite, also it vibrates the tail like a rattlesnake to frighten the foe, but its movement is slow and calm. It was found around forests, grasslands, step zones and near the residential areas in Gorgan.

4.11. Naja Oxiana:

The most famous characteristic of this animal is making a ladle shaped neck in a moving and rushing position, when it is alive. It has a short snout and head is bigger in temporal area. We found 3 specimens of this snake, with 21 dorsal, smooth and oval-shaped scales, but no loreal scales. It is light brown or soiled color. Ventral surface is light yellow with some broad white or cream band on the nape. It was angry when it was captured and frightens the foes by hissing sound, raising the neck, making a ladle and rapid rushing. Their habitat is in hills, farms, flats and sometimes near the settling zones. It can be found in Gorgan or some desert area in Torkeman Sahra.

5. Discussions and Conclusions

Our studies have revealed that the highest number of rampancy belongs to *Natrix* in this area. The color, body style and anterior temporal scales help us to identify them. Female snake is bigger and has shorter tail than the male one[9, 10]. The presence of this genus in our ecosystem is very important, to control the rattles and especially agricultural diseases [11]. It seems that next rampancy is for *Elaphe dione*. While paying attention to the collecting zones it is logical that we placed them among the class of hot climate group. The role of this snake in the agriculture of this area is important. An interesting rushing mood of this snake is to circle the body and twist the body [12]. A debatable point about this snake is the high morphological similarities between *E.dione* and *E.quatuorlineata* species. In this study we identified the species based on the dorsal scales which is 27 in the first one and 29 in the second one, but genetic study is necessary in this connection. A kind of *Z.persica* found in the mediterranean climate was collected. This type is recorded as *Elaphe persica* in Latifi's book [4] and he puts it in this genus but in the latest checklist it is located in a separate genus under the name of *Zamenis* [6]. All species were totally black without subpreocular scales

which make it different and recognizable from *Elaphe*. One of the species which is so blitzing and non venomous is "*Dolichophis jugular*'' which sometimes rush towards the farmers. This snake even follows the foe. Cannibalism is observed in this species. *Naja oxina* is a dangerous and poisonous snake, which is wide spread. It is found in hot, dry and semi-dry areas and at the end of the western parts of province, however we couldn't coollect the specimen. These are visible mostly in July which is the time of their breeding [13]. For its big size, and monochromic color, it can be seen easily. Naturally there are some other species which have were not collected during this study but the rampancy of these species is much higher than others.

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